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# BULLETIN

## OF THE

# TORREY BOTANICAL CLUB

JULY, 1903

### A Preliminary Enumeration of the Grasses of Porto Rico

BY GEORGE V. NASH

This enumeration is based mainly upon the material in the herbarium of the New York Botanical Garden. The collections of Heller, Underwood and Griggs, Wilson and Goll are there fully represented, and those of Sintenis partially so. A few species, of which we have not seen specimens, have been admitted upon the authority of monographers. Further explorations of the island must add more species, and it is hoped that this enumeration may serve as a help in such further exploration. That this work may be facilitated, it has been deemed advisable to incorporate analytical keys to the tribes, genera and species. This enumeration credits the island with 10 of the 13 grass tribes, 37 genera, and 75 species and varieties, among them 9 hitherto unknown.

#### Key to the Tribes

- A. Spikelets falling from the pedicel entire, naked or enclosed in bristles or a bur-like involucre, or immersed in the internodes of a readily disarticulating rachis, 1-flowered, or if 2-flowered the lower flower staminate (perfect in *Isachne*): internodes of the rachilla of the spikelet very short, not measurable.

Spikelets round or somewhat dorsally compressed: hilum punctiform.

Flowering scale and palea hyaline, thin, much more delicate in structure than the thick-membranous to coriaceous empty scales.

Spikelets unisexual.

Tribe I. MAYDEAE.

Spikelets in pairs, one sessile, the other pedicellate, the former perfect, the latter sometimes perfect, often with a staminate flower, or frequently empty, abortive or wanting. Tribe II. ANDROPOGONEAE.

Flowering scale, at least that of the perfect flower, similar in texture to the empty scales, or frequently thicker and firmer, never hyaline and thin.

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Flowering scale and palet membranous.

Inflorescence spicate.

Tribe III. ZOYSIEAE.

Inflorescence paniculate.

Tribe IV. TRISTEGINEAE.

Flowering scale and palet chartaceous, cartilaginous or coriaceous, very different in appearance from the remaining scales.

Tribe V. PANICEAE.

Spikelets much compressed laterally : hilum linear. Tribe VI. ORYZEAE.

B. Spikelets with the empty scales persistent, the rachilla hence articulated above them, 1-many-flowered : internodes of the rachilla of spikelets of 2 or more flowers long and readily measurable.

Stems herbaceous (except in one species of *Panicum*) : leaf-blade sessile, not articulated with the sheath.

Spikelets borne in open or spike-like panicles or racemes, usually upon distinct and often long pedicels.

Spikelets 1-flowered.

Tribe VII. AGROSTIDEAE.

Spikelets 2-many-flowered.

Tribe IX. FESTUCEAE.

Spikelets borne in two rows, on short equal pedicels or sessile.

Tribe VIII. CHLORIDEAE.

Stems woody : leaf-blade with a petiole-like base which is articulated with the sheath.

Tribe X. BAMBUSEAE.

#### Tribe I. MAYDEAE

A tall stout grass with the pistillate spikelets enclosed in a globose white bead-like organ.

1. *Coix*.

#### Tribe II. ANDROPOGONEAE

First scale of the spikelet globose, rugose : racemes not hairy.

2. *Hackelochloa*.

Scales of the spikelet long, flat or convex : racemes hairy.

Racemes singly disposed.

Second scale of the sessile spikelet awnless : pedicellate spikelet smaller than the sessile one.

3. *Schizachyrium*.

Second scale of the sessile spikelet awned : pedicellate spikelet larger than the sessile one.

4. *Diectomis*.

Racemes in pairs, or sometimes 3's-5's.

5. *Andropogon*.

#### Tribe III. ZOYSIEAE

A low grass with a narrow spike-like inflorescence.

6. *Antheophora*.

#### Tribe IV. TRISTEGINEAE

A tall grass with a large panicle of awned spikelets.

7. *Arundinella*.

#### Tribe V. PANICEAE

1. Spikelets all perfect : leaf-blades sessile.

a. Spikelets not sunken in the rachis.

\* Spikelets naked, not involucrate.

Scales 3.

Lowest scale with a thickened ring-like callus. 8. *Monachne*.

Lowest scale unappendaged.

Flowering scale with its opening turned from the rachis.

9. *Paspalum*.

Flowering scale with its opening turned toward the rachis.

10. *Anastrophus*.

Scales 4.

Perfect flowers 2.

11. *Isachne*.

Perfect flower 1.

Second empty scale not saecate at the base.

Empty scales not awned.

Spikelets in very slender 1-sided racemes which are usually whorled or approximate.

12. *Syntherisma*.

Spikelets in panicles or panicked racemes, the latter never whorled, commonly distant.

Spikelets long-hairy, acuminate.

13. *Trichachne*.

Spikelets glabrous or with only short hairs, usually orbicular to ovate, if lanceolate glabrous.

Spikelets hemispheric, orbicular or nearly so in outline, the rachis of the 1-sided racemes winged.

14. *Dimorphostachys*.

Spikelets not hemispheric, varying in outline, usually in panicles, rarely in racemes and then the rachis not winged.

Flowering scale without lateral pits or appendages at the base.

15. *Panicum*.

Flowering scale with pits or membranous appendages at the base.

16. *Ichnanthus*.

Empty scales awned or awn-pointed.

Stems creeping : leaf-blades short and broad.

17. *Oplismenus*.

Stems erect : leaf-blades long and narrow.

18. *Echinochloa*.

Second empty scale saecate at the base.

19. *Sacciolepis*.

\*\* Spikelets involucrate.

Involucre of bristles.

20. *Chaetochloa*.

Involucre of 2 spine-bearing valves.

21. *Cenchrus*.

b. Spikelets sunken in one side of the broad flattened rachis.

22. *Stenotaphrum*.

2. Spikelets monoecious : leaf-blades with a petiole-like base.

23. *Olyra*.

#### Tribe VI. ORYZEAE

Grasses with broad flat leaf-blades and long narrow spikelets.

24. *Pharus*.

#### Tribe VII. AGROSTIDEAE

Flowering scale with three long awns.

25. *Aristida*.

Flowering scale awnless.

26. *Sporobolus*.

#### Tribe VIII. CHLORIDEAE

1. Spikelets with 1 perfect flower.

Spikes digitate or in whorls.

Second empty scale acute : awn of the flowering scales usually long.

27. *Chloris*.

Second empty scale truncate or 2-toothed : flowering scales awnless or awn-pointed.

28. *Eustachys*.

Spikes scattered, single.

29. *Heterosteca*.

2. Spikelets with 2-3 perfect flowers.

Spikes usually digitate : spikelets crowded.

Spikes with terminal spikelets.

30. *Eleusine*.

Spikes with the rachis extending beyond the spikelets in a manifest point.

31. *Dactyloctenium*.

Spikes distant : spikelets alternate.

32. *Leptochloa*.

Tribe IX. FESTUCEAE

Tall grasses with large dense hairy panicles and broad flat leaf-blades.

Dioecious : staminate spikelets glabrous.

33. *Gyncrium*.

Hermaphrodite : spikelets hairy.

34. *Phragmites*.

Low grasses with open glabrous panicles.

Empty scales 2 : flowering scales 3-nerved.

35. *Eragrostis*.

Empty scales 3-6 : flowering scales many-nerved.

36. *Uniola*.

Tribe X. BAMBUSEAE

Grasses with woody stems and the leaves often fasciculately arranged.

37. *Arthrostylidium*.

1. COIX L. Sp. Pl. 972. 1753

1. COIX LACHRYMA-JOBI L. Sp. Pl. 972. 1753.

In wet places, frequent. Between Aibonito and Cayey, Heller 528 ; Rio Piedras, Goll 316 ; Adjuntas road, near Ponce, Heller 6075.

2. HACKELOCHLOA Kuntze, Rev. Gen. 2 : 776.

1891

*Manisuris* Sw. Prod. 25. 1788.

1. HACKELOCHLOA GRANULARIS (L.) Kuntze, Rev. Gen. Pl. 2 : 776. 1891.

*Cenchrus granularis* L. Mant. 575. 1771.

*Manisuris granularis* Sw. Prod. 25. 1788.

Near Mayaguez, Heller 4401.

3. SCHIZACHYRIUM Nees, Agrost. Bras. 331. 1829

1. SCHIZACHYRIUM brevifolium (Sw.) Nees ; Kunth, Enum. 1 : 488. 1833.

*Andropogon brevifolius* Sw. Prod. 26. 1788.

Adjuntas road, near Ponce, Heller 6230.

## 4. DIECTOMIS H.B.K. Nov. Gen. &amp; Sp. 1: 193. 1815

1. DIECTOMIS FASTIGIATA (Sw.) H.B.K. Nov. Gen. & Sp. 1: 193,  
*pl.* 64. 1815.

*Andropogon fastigiatus* Sw. Prod. 26. 1788.

Meadows on Mt. Santano, Coamo, Sintenis 3247.

## 5. ANDROPOGON L. Sp. Pl. 1043. 1753

Racemes not surrounded by bracts : spikelets awnless : foliage not lemon-scented.

Stems tall and stout, the inflorescence large and much-branched.

1. *A. bicornis*.

Stems low, tufted, slender, the inflorescence slender and consisting of but few branches.

2. *A. leucostachys*.

Racemes surrounded by sheathing bracts : spikelets awned : foliage lemon-scented.

3. *A. Nardus*.

1. ANDROPOGON BICORNIS L. Sp. Pl. 1043. 1753.

In dry soil, frequent. Luquillo Mts., Wilson 226 ; Santurce, Heller 597.

2. ANDROPOGON LEUCOSTACHYS H.B.K. Nov. Gen. & Sp. 1: 187.  
 1815.

Sandy soil, frequent. Heller 933, 984 and 4396 ; Goll 326.

3. ANDROPOGON NARDUS L. Sp. Pl. 1046. 1753.

Santurce, Heller 229 (leaves only). The immature character of the only specimen of this grass we have seen from Porto Rico makes its definite determination impossible. In leaf character it strongly resembles this species.

## 6. ANTHEPHORA Schreb. Besch. Graes. 3: 105. 1810

1. ANTHEPHORA HERMAPHRODITA (L.) Kuntze, Rev. Gen. 759.  
 1891.

*Tripsacum hermaphroditum* L. Syst. Ed. 10, 1261. 1759.

*Anthephora elegans* Schreb. Besch. Graes. 3: 105. 1810.

In waste places, frequent. Santurce, Heller 165 and 1348.

7. ARUNDINELLA Raddi, Agrost. Bras. 37, *pl.* 1. 1823

1. ARUNDINELLA MARTINICENSIS Trin. Gram. Pan. 62. 1826.

Caguas, Heller, 934 ; Mayaguez, Heller, 4355 ; Adjuntas road, near Ponce, Heller 6256.

8. MONACHNE Beauv. Agrost. 49, *pl.* 10. 1812*Eriochloa* H.B.K. Nov. Gen. & Sp. 1: 94, *pl.* 30, 31. 1815.

Rachis of the inflorescence softly pubescent with short spreading hairs: outer scales of the spikelet pubescent with many long stiff hairs. 1. *M. punctata*.

Rachis merely scabrous on the angles: outer scales less pubescent and with shorter finer hairs. 2. *M. subglabra*.

## 1. MONACHNE PUNCTATA (L.).

*Milium punctatum* L. Syst. Ed. 10, 872. 1759.*Eriochloa punctata* Hamilt. Prod. 5. 1825.

Humacao, Blauner; Adjuntas road, near Ponce, Heller 6298.

2. *Monachne subglabra* sp. nov.

A tall somewhat branching grass with rather broad, flat leaf-blades. Stems 8–12 dm. long, glabrous, the nodes densely pubescent with short, spreading hairs: leaves numerous; sheaths usually shorter than the internodes and much shorter than the blades, ciliate on the margins, the lower ones papillose-hirsute between the nerves; ligule a ring of short hairs; blades linear to lanceolate, flat, ascending, or the longer ones drooping, glabrous, very rough on the margins, long-acuminate at the apex, generally narrowed toward the base, 1–3 dm. long and 7–17 mm. wide: inflorescence finally somewhat exserted, the rachis hispidulous on the ridges: racemes ascending, commonly 6–10, the larger 4–6 cm. long, the rachis hispidulous on the margins and more or less setiferous: spikelets on shorter pedicels which usually bear a few long hairs, 3.5 mm. long and about 1.3 mm. wide, elliptic to ovate-lanceolate, acute, a short semicircular first scale usually present, the second and third scales about equal in length, acute, rather sparingly pubescent with appressed hairs, 5-nerved, the third scale bearing in its axil a palet of equal length and a staminate flower, the fourth scale about three fourths as long as the spikelet, elliptic, mucronate, finely transverse-rugose.

Collected at Martin Peña January 31, 1899, by Heller, no. 380.

## 9. PASPALUM L. Syst. Ed. 10, 855. 1759

## 1. Racemes scattered along the axis of the inflorescence.

*a.* Spikelets broadly elliptic to orbicular, one half as wide as long; rachis of racemes manifestly wing-margined.

\* Spikelets not margined.

Stems erect or nearly so, stout: leaf-blades long: outer scales of the spikelet with a midnerve.

Spikelets glabrous.

Third scale of the spikelet white or yellowish at maturity: basal

leaf-sheaths very broad and reticulated, at least when dry-  
Spikelets about 1.5 mm. long : racemes numerous.

1. *P. densum*.

Spikelets about 2.5 mm. long : racemes 12-18.

2. *P. Underwoodii*.

Third scale dark brown at maturity : basal sheaths not broad  
nor reticulated.

3. *P. Boscianum*.

Spikelets pubescent.

Spikelets elliptic, about one half as wide as long, the pubes-  
cence appressed.

4. *P. Helleri*.

Spikelets broadly oval or obovate, the pubescence spreading.

Spikelets less than 1.5 mm. long. 5. *P. hemisphaericum*.

Spikelets 2.5-3 mm. long. 6. *P. virgatum*.

Stems slender, creeping at the base : leaf-blades short, rarely more than  
5 cm. long : outer scales of the spikelet without a midnerve.

7. *P. orbiculatum*.

\*\* Spikelets surrounded by a broad toothed margin. 8. *P. fimbriatum*.

b. Spikelets narrowly elliptic, less than one half as broad as long : rachis of racemes  
barely, if at all, margined. 9. *P. Portoricense*.

2. Racemes long and slender, arising in pairs at the apex of the stem, rarely with another  
one a short distance below. 10. *P. conjugatum*.

1. *PASPALUM DENSUM* Poir. in Lam. Encycl. 5 : 32. 1804.

A single specimen of this species from Porto Rico has been  
seen by the writer, and is the type in the herbarium of Lamarck  
at Paris ; it was collected by Ledru.

2. *Paspalum Underwoodii* sp. nov.

A tall perennial with reticulated basal leaf-sheaths, elongated  
leaf-blades and rather dense inflorescence. Stems 8-12 dm. tall,  
erect, rather stout at the base : leaves numerous at the base ;  
sheaths glabrous, the basal ones strongly reticulated, at least when  
dry, rather abruptly narrowed into the blade at or below the mid-  
dle, equitant ; ligule a scarious ring ; blades 4-7 dm. long, about  
1 cm. wide, long-acuminate at the summit, exceedingly rough on  
the lower surface, densely hirsute on the upper surface, serrulate  
on the margins : inflorescence 1.5-2.5 dm. long : racemes 12-18,  
sessile or nearly so, ascending or nearly erect, the lower ones 7-10  
cm. long, the rachis including its serrulate wings about 1 mm.  
wide and more or less setiferous, usually purplish : spikelets in  
pairs in two rows, on short hispid pedicels, yellowish green, usu-  
ally more or less purplish tinged, glabrous, broadly obovate, 2.5  
mm. long, 2 mm. broad, and about 0.8 mm. thick, apiculate, the  
2 outer scales 3-nerved, apiculate, the third scale yellowish-white,  
oval, 2.2 mm. long and about 1.7 mm. wide, minutely striate.

Type collected by Underwood and Griggs along roadsides,



Mayaguez to Joyua, June 14 to July 22, 1901, no. 149. The following specimens also belong here: Plaza de Humacao, Eggers 676, 1881; between Mayaguez and Añasco, Sintenis 1223, 1885, and near Guanica, 3412*b*, 1885, of the same collector; Santurce, Heller 594; near Mayaguez, Heller 4368.

Related to *P. densum* Poir., but that has more numerous racemes and much smaller spikelets.

3. *PASPALUM BOSCIANUM* Fluegge, Gram. Mon. 171. 1810.

*Paspalum purpurascens* Ell. Bot. S. C. & Ga. 1: 108. 1817.

El Yunque, Luquillo Mts., Wilson 43.

4. *Paspalum Helleri* sp. nov.

A tufted nearly glabrous perennial. Stems 4–8 dm. tall, finally branching above, rather slender, smooth and glabrous, the nodes glabrous: leaves usually 3; sheaths smooth and glabrous, shorter than the internodes; ligule a scarious ring about 1 mm. long; blades erect, or drooping at the end, smooth and glabrous on the surfaces with the exception of some long hairs on the upper surface just back of the ligule, the margins rough, linear, acuminate at the apex, the larger ones 1.5–2.5 dm. long and 5–7 mm. wide: racemes 2–4, sometimes single on the branches, slender, 6–9 cm. long, the rachis more or less flexuous, winged and about 1 mm. wide: spikelets in pairs, 2 mm. long and about 1 mm. wide, elliptic, obtuse, the two outer scales 3-nerved, the first scale pubescent with long weak hairs, the second one glabrous, the third scale and palet greenish.

In fields and waste places. Type collected at Santurce, Jan. 9, 1899, by Heller, no. 10. No. 164, secured by this collector at the same place, also belongs here.

5. *PASPALUM HEMISPHAERICUM* Poir. in Lam. Encycl. 5: 31. 1804.

*Paspalum paniculatum* Gaertn. Fruct. Sem. 2: 2, *pl.* 80. 1791. In part. Not Linnaeus.

Near Mayaguez, Heller 4399; Adjuntas road, near Ponce, Heller 6227.

6. *PASPALUM VIRGATUM* L. Syst. Ed. 10, 855. 1759.

In sandy soil, common. Luquillo Mts., Wilson 227; Rio Piedras, Heller 130 and 625; Cataño, Heller 1373; Underwood and Griggs 794.

7. *PASPALUM ORBICULATUM* Poir. in Lam. Encycl. **5**: 32. 1804.  
*Paspalum pusillum* Vent. ; Fluegge, Gram. Mon. 100. 1810.  
 Wet banks, south of San Juan, Heller 664.

8. *PASPALUM FIMBRIATUM* H.B.K. Nov. Gen. & Sp. **1**: 93, *pl.*  
*28*. 1815.

In ditch, Coamo to Ponce, Underwood and Griggs 576 ; Ponce, Heller 6219.

9. ***Paspalum Portoricense*** sp. nov.

A low tufted nearly glabrous slender perennial. Stems about 1 dm. tall, glabrous, with the exception of a few hairs at the nodes, simple : leaves 2 or 3 ; sheaths glabrous, usually shorter than the internodes and shorter than the blades ; ligule scarious, acute, 1-2 mm. long ; blades ascending, flat, rather thin, the upper surface with some long hairs at the very base and a few scattered ones elsewhere, sparingly ciliate on the margins, the lower surface glabrous, linear, acuminate at the apex, usually more or less narrowed toward the base : inflorescence very slender, about 2 cm. long, of 1 or 2 erect branches : spikelets in pairs, one on a long and the other on a short pedicel, elliptic, 1.8 mm. long and 0.7 mm. wide, usually purplish tinged, glabrous, the first and second scales 3-nerved, the third scale greenish-white, a little shorter than the outer scales, obtuse.

Type collected between Aibonito and Cayey, February 8, 1899, by Heller, no. 524.

10. *PASPALUM CONJUGATUM* Berg. Act. Helv. **7**: 129, *pl. 8*. 1772.

Near Mayaguez, Heller 4397 ; Mayaguez to Joyua, Underwood and Griggs 175 ; Luquillo Mts., Wilson 159.

10. *ANASTROPHUS* Schlecht. Bot. Zeit. **8**: 681. 1850.

11. *ANASTROPHUS COMPRESSUS* (Sw.) Schlecht. ; Doell. in Mart. Fl. Bras. **2**<sup>2</sup>: 102. 1877.

*Milium compressum* Sw. Prod. 24. 1788.

Rio Blanco, Blauner.

11. *ISACHNE* R. Br. Prod. 196. 1810

1. ***Isachne angustifolium*** sp. nov.

A prostrate leafy branching perennial, forming large mats, with narrow leaf-blades and rather small panicles. Stems 1 m. long or less, glabrous or very sparingly pubescent below, the

uppermost internode minutely appressed-pubescent: leaves numerous; sheaths glabrous or sparingly hispid, papillose-ciliate on the margins, those on the main stem shorter than the internodes, those on the branches overlapping; ligule a ring of short hairs; blades erect or ascending, linear to linear-lanceolate, acuminate, rough and green on the upper surface, smooth and glaucous on the lower surface, the lower the shorter, only 2-3 cm. long, increasing in length toward the summit where they are 5-10 cm. long and 4-6 mm. wide: panicles long-exserted, 5-8 cm. long, their main axis and widely spreading primary branches minutely pubescent, the secondary branches similarly pubescent and at an angle of about 45° with the primary branches: spikelets about 1.5 mm. long, on shorter pedicels, the two outer scales about equal in length, equalling or a little shorter than the spikelet and sparingly pubescent at the apex, obtuse, the first broadly oval, the second almost orbicular, the two flowering scales glabrous, yellowish, about 1.3 mm. long.

On the summit of El Yunque, Luquillo Mountains, Porto Rico, Wilson, no. 160.

## 12. SYNTERISMA Walt. Fl. Car. 76. 1788

Spikelets one quarter as wide as long or more, acute, the fourth scale yellowish when mature.

1. *S. fimbriatum*.

Spikelets one fifth as wide as long, acuminate, the fourth scale greenish when mature.

2. *S. setosum*.

### 1. SYNTERISMA FIMBRIATUM (Link) Nash, Bull. Torrey Club, 25: 302. 1898.

*Digitaria fimbriata* Link, Hort. Berol. 1: 226. 1827.

Waste places, common. Cataño, Heller 107, and Bayamon, Heller 422.

### 2. SYNTERISMA SETOSUM (Desv.) Nash, Bull. Torrey Club, 25: 300. 1898.

*Digitaria setosa* Desv.; Hamilt. Prod. 6. 1825.

Near Mayaguez, Heller 4398.

## 13. TRICHACHNE Nees, Agrost. Bras. 85. 1829

### 1. TRICHACHNE INSULARE (L.) Nees, Agrost. Bras. 86. 1829.

*Andropogon insularis* L. Syst. Ed. 10, 1304. 1759.

*Panicum leucophaeum* H.B.K. Nov. Gen. & Sp. 1: 97. 1815.

In fields and along streams, frequent. Heller 136 and 650; Underwood and Griggs 131 and 564; Goll 479; Adjuntas road, near Ponce, Heller 6158.

## 14. DIMORPHOSTACHYS Fourn. Comptes-Rendus Acad.

Par. 80 : 441. 1875

1. DIMORPHOSTACHYS PEDUNCULATA (Poir.) Fourn. Mex. Pl. 2 :  
15. 1886.*Paspalum pedunculatum* Poir. in Lam. Encycl. Suppl. 4 : 315.  
1816.

Adjuntas road, near Ponce, Heller 6354.

## 15. PANICUM L. Sp. Pl. 55. 1753

## 1. Apex of the panicle-branches not extending beyond the insertion of the spikelets.

## a. Stems herbaceous.

Spikelets scattered, on long pedicels of varying length.

Fourth scale of the spikelet smooth : low grasses, less than 5 dm. tall.

Panicle large and effuse, over 1 dm. long : spikelets numerous, less than 1.5 mm. long.

Leaf-blades narrowly ovate, rarely exceeding 7 cm. long :  
spikelets 1 mm. long. 1. *P. brevifolium*.Leaf-blades lanceolate, rarely less than 1 dm. long : spikelets  
1.3 mm. long. 2. *P. trichanthum*.Panicle small, less than 1 dm. long : spikelets few, 1.5 mm. long or  
more.

Stems erect, if prostrate in age never rooting at the lower nodes.

Spikelets less than 2 mm. long.

Leaf-blades with the upper surface hirsute, the larger  
over 1 cm. wide. 3. *P. comophyllum*.Leaf-blades with the upper surface glabrous or merely  
puberulent, less than 5 mm. wide.4. *P. Nashianum*.Spikelets more than 2 mm. long. 5. *P. consanguineum*.Stems erect only toward the end, the base prostrate and rooting  
at the lower nodes.

Leaf-blades lanceolate, pubescent, less than 5 mm. wide.

6. *P. parvifolium*.

Leaf-blades ovate-lanceolate, more than 5 mm. wide.

7. *P. oplismenoides*.

Fourth scale of the spikelet transversely rugose : tall stout grasses.

8. *P. maximum*.Spikelets crowded on short nearly equal pedicels, in short clusters on one side  
of the panicle-branches.Outer scales of the spikelet with cross-veinlets connecting the longitu-  
dinal nerves. 9. *P. paniculatum*.

Outer scales without cross-veinlets.

Fourth scale of the spikelet transversely rugose.

Spikelets about 2 mm. long : stems slender : leaf-blades ovate-  
lanceolate, usually less than 5 cm. long.10. *P. prostratum*.

- Spikelets about 3 mm. long : stems stout : leaf-blades long and linear. 11. *P. molle*.  
 Fourth scale of the spikelet smooth. 12. *P. laxum*.  
*b.* Stems woody, bamboo-like. 13. *P. latifolium*.  
 2. Apex of the panicle-branches extending beyond the insertion of the spikelets in an awn-like appendage.  
 Second scale of the spikelet 3-nerved, the fourth scale smooth. 14. *P. Sintenisii*.  
 Second scale of the spikelet 5-7-nerved, the fourth scale transversely rugose. 15. *P. flavescens*.

1. *PANICUM BREVIFOLIUM* L. Sp. Pl. 59. 1753.

In fields and waste places, frequent. Santurce, Heller 157 ; Martin Peña, Heller 387 ; Luquillo Mts., Wilson 283 ; Adjuntas road, near Ponce, Heller 6094.

2. *PANICUM TRICHANTHUM* Nees, Agrost. Bras. 210. 1829.

In moist ground, between Aibonito and Cayey, Heller 531.

3. *Panicum comophyllum* sp. nov.

A tufted densely pubescent perennial, finally much-branched, with broad flat leaf-blades and rather large panicles. Stems 3-4 dm. tall, hirsute with long ascending hairs : leaves 5-7 ; sheaths densely hirsute with spreading hairs, the primary ones shorter than the internodes and the blades ; ligule a ring of stiff hairs about 2 mm. long ; blades spreading or ascending, flat, softly hirsute on both surfaces with spreading hairs, those on the upper surface the longer, ciliate on the margin with stiffer hairs ; those on the main stem oblong-linear to ovate-lanceolate, acute, barely cordate at the somewhat clasping base, 5-7 cm. long, 10-13 mm. wide : panicle somewhat exserted, 5-7 cm. long and about as broad, broadly ovate, the main axis pubescent with short spreading hairs, its branches somewhat ascending : spikelets broadly obovate, 1.5 mm. long and about 1 mm. wide, pubescent with spreading hairs.

Type collected in rich soil at Santurce, January 9, 1899, by Heller, no. 12.

Related to *P. ciliosum* Nash, of the southern United States, but readily distinguished by its softly pubescent leaf-blades.

4. *PANICUM NASHIANUM* Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 7 : 79. 1897.

In sand, quite common. Vega Baja, Heller, 639 ; Manati to

Vega Baja, Underwood and Griggs 955; Santurce, Heller 982b and 6442.

5. *Panicum consanguineum* Kunth, Rev. Gram. 1: 36. 1829.

Sandy soil, Santurce, Heller 982.

6. *Panicum parvifolium* Lam. Ill. 1: 173. 1791.

Bayamon, Sintenis 1216.

7. ***Panicum oplismenoides* sp. nov.**

A smooth and glabrous prostrate leafy perennial with much of the habit of *Oplismenus setarius*, with short broadly lanceolate leaf-blades and spreading panicles. Stems slender, rooting at the lower nodes, branching: leaves numerous; sheaths much shorter than the internodes and about one half as long as their blades; ligule a very narrow scarious ring; blades spreading, shorter than the internodes, broadly lanceolate to ovate-lanceolate, often somewhat undulate on the margins, 2-3 cm. long, 6-10 mm. wide: panicles but little exserted, broadly ovate, 3-4 cm. long, the branches spreading: spikelets elliptic, 1.8-2 mm. long and a little less than 1 mm. broad, the first scale a little more than one half as long as the spikelet, 5-nerved, broadly ovate, obtuse, the second and third about equal in length, 5-nerved, a little exceeding the white flowering scale, the third scale with a manifest palet nearly as long as itself.

Collected on the edge of a ditch at Vega Baja, May 9, 1899, by Heller, no. 1316.

Related in habit and general appearance to *P. polygonoides* Lam., but in that the leaf-blades are smaller and with hispid sheaths and the spikelets globular.

8. *Panicum maximum* Jacq. Ic. Pl. Rar. 1: 13. 1781-6.

Martin Peña, Heller 377; Martin Peña and Lecheria, Goll 31.

9. ***Panicum paniculatum* (L.).**

*Paspalum paniculatum* L. Syst. Ed. 10, 855. 1759.

*Panicum fasciculatum* Sw. Prod. 22. 1788.

In sandy and rocky soil, frequent. Rio Piedras, Heller 135; Aguadilla, Heller 4528; Sprengel; H. Wydler 311; Adjuntas road, near Ponce, Heller 6226 and 6302.

It may be of interest to note here that the specimen from which Sloane's figure (Hist. Jam. *pl.* 72, *f.* 2) was drawn, and on which Linnaeus based his *Paspalum paniculatum*, has been examined by

the writer, and that it is what is commonly known as *Panicum fasciculatum* Sw.

10. *Panicum prostratum* Lam. Ill. 1: 171. 1791.

Cane field between Ponce and Coamo, Heller 497.

11. *Panicum molle* Sw. Prod. 22. 1788.

Along railroad, Bayamon, Heller 100; Yauco, Heller 6293.

12. *Panicum laxum* Sw. Prod. 23. 1788.

In fields, common. Between Aibonito and Cayey, [Heller 522; Santurce, Heller 983; Cataño, Heller 1378.

13. *Panicum latifolium* L. Sp. Pl. 58. 1753.

In woods and thickets, common. Maricao, Sintenis 215; Mayaguez, Heller 4375; Arecibo, Heller 343; Luquillo Mts., Wilson 350; Coamo, Goll 699; Bayamon, Goll 227.

14. *Panicum Sintenisii* sp. nov.

A tufted glabrous perennial with long narrow flat leaf-blades and a slender panicle. Stem 4–6 dm. tall, slender, producing panicle-bearing branches from the upper sheaths: leaves about 4; sheaths several times shorter than the internodes and the blades; ligule a ring of short hairs; blades narrow and elongated, flat toward the apex, but folded below for a considerable distance, at least when dry, giving the blade a long-stalked appearance, 1–2 dm. long and about 2 mm. wide at the flat portion, the lower folded portion about one quarter this width, long-acuminate: panicle very slender, 4–7 cm. long, its branches appressed, 1–2 cm. long, each running out into a bristle-like termination as do its divisions: spikelets about 2 mm. long, acute, as are also all the scales, the first scale 1-nerved, about one half as long as the spikelet, the second one 3-nerved, about two thirds as long as the spikelet, the third scale 5-nerved and equalling the fourth scale or a little shorter than it, the fourth scale very acute.

In woods, Guanica, Sintenis 3463.

Related to *P. Chapmani* Vasey, but that has stouter spikelets and all the scales with more nerves.

15. *Panicum flavescens* Sw. Prod. 23. 1788.

Near Mayaguez, Heller 4373 and 4488.

16. ICHNANTHUS Beauv. Agrost. 56, *pl.* 12, *f.* 1. 1812  
 I. ICHNANTHUS PALLENS (Sw.) Munro; Benth. Fl. Hongk. 414. 1861.  
*Panicum pallens* Sw. Prod. 23. 1788.  
 In wet shaded places, common. Bayamon, Heller 92; Santurce, Heller 826; Mayaguez, Heller 4374 and 4479; Puente Fluco, Goll 884; Adjuntas road, near Ponce, Heller 6093.
17. OPLISMENUS Beauv. Fl. Owar. 2: 14, *pl.* 68. 1807  
 I. OPLISMENUS SETARIUS (Lam.) R. & S. Syst. 2: 481. 1817.  
*Panicum setarium* Lam. Ill. 1: 170. 1791.  
 In moist soil, frequent. Piñon, Goll 623; Adjuntas road, near Ponce, Heller 6303.
18. ECHINOCHLOA Beauv. Agrost. 53, *pl.* 11, *f.* 11. 1812.  
 I. ECHINOCHLOA COLONA (L.) Link, Hort. Berol. 2: 209. 1833.  
*Panicum colonum* L. Syst. Ed. 10, 870. 1759.  
 In fields and waste places, common. Cataño, Heller 108; Mayaguez, Heller 4409; Coamo Springs, Goll 660.
19. SACCIOLEPIS Nash, in Britt. Man. 89. 1901.  
 I. **Sacciolepis striata** (L.).  
*Holcus striatus* L. Sp. Pl. 1048. 1753.  
*Panicum striatum* Lam. Ill. 1: 172. 1791.  
*Panicum gibbum* Ell. Bot. S. C. & Ga. 1: 116. 1817.  
*Sacciolepis gibba* (Ell.) Nash, in Britt. Man. 89. 1901.  
 Wet ground, near Santurce, Heller 1363.
20. CHAETOCHLOA Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 4: 38. 1897  
 Setae at the base of the spikelet 5 or more, involucrate, antrorsely scabrous.  
 Setae short, not more than twice as long as the spikelet: inflorescence usually slender. 1. *C. purpurascens*.  
 Setae longer; inflorescence stout. 2. *C. imberbis*.  
 Setae 1-3 at the base of each spikelet, not involucrate, retrorsely scabrous above, antrorsely below. 3. *C. scandens*.



1. CHAETOCHLOA PURPURASCENS (H.B.K.) S. & M. Bull. U. S. Dept. Agric. Div. Agrost. 21 : 13. 1900.  
*Setaria purpurascens* H.B.K. Nov. Gen. & Sp. 1 : 110. 1815.  
 In fields and waste places, frequent. Santurce, Heller 14 and 329.

2. CHAETOCHLOA IMBERBIS (Poir.) Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 4 : 39. 1897.  
*Panicum imberbe* Poir. in Lam. Encycl. Suppl. 4 : 272. 1816.  
 Sintonis 208 (*fide* Scribn. & Merr. l. c.); Adjuntas road, near Ponce, Heller 6240.

- CHAETOCHLOA IMBERBIS GENICULATA (Lam.) S. & M. Bull. U. S. Dept. Agric. Div. Agrost. 21 : 12. 1900.  
*Panicum geniculatum* Lam. Encycl. 4 : 727. 1797.  
 Differs from the species in having stouter geniculate stems, broader leaf-blades, and a longer inflorescence.  
 Humacao, Blauner 233.

3. CHAETOCHLOA SCANDENS (Schrad.) S. & M. Bull. U. S. Dept. Agric. Div. Agrost. 21 : 17. 1900.  
*Setaria scandens* Schrad., Schult. Mant. 2 : 279. 1824.  
 Sintonis 6498 (*fide* Scribn. & Merr. l. c.).

#### 21. CENCHRUS L. Sp. Pl. 1049. 1753

Involucres 4-6-flowered, armed at the base with erect barbed bristles.

1. *C. echinatus*.

Involucres 2-flowered, armed at the base with generally shorter reflexed spines.

2. *C. tribuloides*.

1. CENCHRUS ECHINATUS L. Sp. Pl. 1050. 1753.  
 In sandy waste places, common. Santurce, Heller 3 and 1346; Cayey, Underwood and Griggs 406.
2. CENCHRUS TRIBULOIDES L. Sp. Pl. 1050. 1753.  
 Fajardo, Blauner 242.

#### 22. STENOTAPHRUM Trin. Fund. Agrost. 175. 1820

1. STENOTAPHRUM SECUNDATUM (Walt.) Kuntze, Rev. Gen. 794. 1891.  
*Ischaemum secundatum* Walt. Fl. Car. 249. 1788.  
 Roadside near Bayamon, Heller 1241; in sand, Manati to Vega Baja, Underwood and Griggs 959.

23. OLYRA L. Syst. Ed. 10, 1261. 1759

1. OLYRA LATIFOLIA L. Syst. Ed. 10, 1261. 1759.

Near Mayaguez, Heller 4443 and 4583.

24. PHARUS P. Br. Hist. Jam. 344. 1756

1. PHARUS BRASILIENSIS Raddi, Agrost. Bras. 21. 1823.

Rio Blanco, Blauner ; ravine, Coamo Springs, Underwood and Griggs 505 and 845.

25. ARISTIDA L. Sp. Pl. 82. 1753

1. ARISTIDA DISPERSA Trin. & Rupr. Mem. Acad. Sci. St. Petersburg.

VI. 7: 129. 1829.

Guanica, Sintenis 3766.

26. SPOROBOLUS R. Br. Prod. 169. 1810

Stems tufted, not arising from rootstocks.

Spikelets about 2 mm. long, the second scale half as long or less.

1. *S. Indicus*.

Spikelets about 3 mm. long, the second scale fully as long.

2. *S. purpurascens*.

Stems arising from long branching rootstocks.

3. *S. Virginicus*.

1. SPOROBOLUS INDICUS (L.) R. Br. Prod. 170. 1810.

*Agrostis Indica* L. Sp. Pl. 63. 1753.

In sandy soil, common. Santurce, Heller 985 and 1275 ; Lecheria, Goll 22.

2. SPOROBOLUS PURPURASCENS (Sw.) Hamilt. Prod. 5. 1825.

*Agrostis purpurascens* Sw. Prod. 25. 1788.

Near Mayaguez, Heller 4590.

3. SPOROBOLUS VIRGINICUS (L.) Kunth, Rev. Gram. 1: 67. 1829.

*Agrostis Virginica* L. Sp. Pl. 63. 1753.

On sand dunes and in sandy soil, frequent. Santurce, Heller 1412 ; Maunabo, Sintenis 5084.

27. CHLORIS Sw. Prod. 25. 1788.

Spikes slender : flowering scale lanceolate, not long-ciliate.

1. *C. radiata*.

Spikes stout : flowering scale oval, long-ciliate on the margins above.

2. *C. Paraguensis*.

1. CHLORIS RADIATA Sw. Prod. 26. 1788.

In moist soil and waste places, common. Cataño, Heller 109 ;

Rio Piedras, Heller 195 and 196; Bayamon, Underwood and Griggs 883; Santurce, Heller 6380.

2. *CHLORIS PARAGUIENSIS* Steud. Syn. Pl. Gram. 204. 1855.

*Chloris barbatum* Sw. Fl. Ind. Occ. 1: 200. 1797. Not  
*Andropogon barbatum* L. Amoen. Acad. 5: 412. 1759.

Near Mayaguez, Heller 4417.

28. *EUSTACHYS* Desv. Nouv. Bull. Soc. Philom. 2:  
188. 1810

1. *EUSTACHYS PETRAEA* (Sw.) Desv. Nouv. Bull. Soc. Philom. 2:  
189. 1810.

In sand, Vega Baja, Heller 131; Santurce, Heller 6422.

29. *HETEROSTECA* Desv. Nouv. Bull. Soc. Philom.  
2: 188. 1810

1. *Heterosteca rhadina* sp. nov.

Stems tufted, 2.5–4 dm. long, slender, finally prostrate at the base and branching above; leaves several; sheaths strongly nerved, glabrous, or the lower ones sometimes more or less pubescent; ligule a narrow scarious ring; blades flat, narrowly linear, acuminate, more or less hirsute on both surfaces, especially on the upper, less than 1 dm. long, 1–2 mm. wide; spikes 3–7, short, spreading or reflexed, of 1–3 spikelets, the 3-angled rachis hispidulous on the angles, its internodes long, usually exceeding one half the length of the empty scales; spikelets distant, appressed to the rachis, the purple empty scales very acute, 1-nerved, hispidulous on the stout midrib, the first shorter than the second which is 5–6 mm. long, the first flowering scale 3-nerved, the nerves extending into short awns, the lateral ones barely reaching the apex of the body of the scale, the central one extending about 1 mm. beyond it, enclosing a perfect flower and a palet longer than its body, the second flowering scale likewise 3-nerved, the nerves extending into hispidulous awns longer than the body, enclosing a staminate flower and a longer palet.

Collected on the Adjuntas road, near Ponce, by Heller, no. 6057, and distributed as *Bouteloua Americana* (Sw.) Scribn. The *Aristida Americana* cited in the synonymy of *Bouteloua litigiosa* Lag. by Grisebach (Fl. Brit. W. I. 537) is accredited to Swartz (Obs. Bot. t. 2, f. 2). Swartz, however, distinctly indicates there the real authorship of the species by quoting the original Linnaean

description in the *Systema Naturae*. Both authors refer the plant to Jamaica, so that the plate and description of Swartz may in all probability be safely taken as characterizing the Linnaean plant also. The genus *Heterosteca* was founded by Desvaux on one species, *H. juncifolia*. At a later date he probably became acquainted with the *Aristida Americana* Sw., for in a subsequent publication (*Jour. de Bot.* 3: 68. 1813) he changes the name to *Heterosteca Americana*, citing *H. juncifolia* as a synonym.

The plant of Swartz is quite different from the one we have under consideration, differing in the more numerous spikes with more spikelets, and in the second flowering scale being reduced to a 3-awned empty rudiment.

30. ELEUSINE Gaertn. *Fruct.* 1: 7. 1788

1. ELEUSINE INDICA (L.) Gaertn. *Fruct.* 1: 8. 1788.

*Cynosurus Indicus* L. *Sp. Pl.* 72. 1753.

In cultivated and waste ground, common. Cataño, Heller 110; between Ponce and Coamo, Heller 499; Mayaguez, Heller 4410; Lecheria, Goll 20.

31. DACTYLOCTENIUM Willd. *Enum.* 1029. 1809

1. DACTYLOCTENIUM AEGYPTIUM (L.) Willd. *Enum.* 1029. 1809.

*Cynosurus Aegyptius* L. *Sp. Pl.* 72. 1753.

In cultivated and waste grounds, common. Santurce, Heller 155; Mayaguez, Heller 4411; Guanica, Sintenis 3469; Guayama, Goll, 513; Coamo Springs, Goll 661; Bayamon, Underwood and Griggs 900.

32. LEPTOCHLOA Beauv. *Agrost.* 71, *pl.* 15, *f.* 1.

1812

1. LEPTOCHLOA VIRGATA Beauv. *Agrost.* 166. 1812.

Moist ground near Añasco, Heller 4535.

33. GYNERIUM H. & B. *Pl. Aequin.* 2: 112, *pl.* 115.

1809

1. GYNERIUM SACCHAROIDES H. & B. *Pl. Aequin.* 2: 112, *pl.* 115.

1809.

Along streams, Yauco, Underwood and Griggs 718.

## 34. PHRAGMITES Trin. Fund. Agrost. 134. 1820

1. PHRAGMITES OCCIDENTALIS (Sieb.) Trin.; Steud. Nomen. Ed. 2, 2: 324. 1841.

*Arundo occidentalis* Sieb.; Schult. Mant. 2: 289. 1824.

Near Guanica, Heller 6289. This specimen is doubtfully referred here, its immaturity preventing a more definite determination. It was distributed as *Arundo Donax*; it hardly appears to be that plant, however. It may only be a form of the world-wide *P. Phragmites*. Mature flowering specimens of this are greatly desired.

## 35. ERAGROSTIS Beauv. Agrost. 70, pl. 14, f. 11. 1812

Flowers perfect: stems not rooting at the lower nodes.

Palet long-ciliate on the margins: panicle narrow and spike-like.

1. *E. ciliaris*.

Palet not long-ciliate: panicle loose and open.

Annual: leaf-blades less than 1 dm. long.

2. *E. Purshii*.

Perennial: leaf-blades more than 1 dm. long.

3. *E. Elliottii*.

Flowers dioecious: stems creeping.

4. *E. hypnoides*.

1. ERAGROSTIS CILIARIS (L.) Link, Hort. Berol. 1: 192. 1827.

*Poa ciliaris* L. Syst. Ed. 10, 875. 1759.

In waste and cultivated soil, common. Bayamon, Heller 101; Santurce, Heller 156 and 6404; Cabo Rojo, Sintenis 838; Bayamon, Underwood and Griggs 895; Ponce, Heller 6218.

2. ERAGROSTIS PURSHII Schrad; Schlecht. Linnaea, 12: 451. 1838.

Rio Piedras, Heller 197; between Aibonito and Cayey, Heller 551; Montellano, Goll 473; Adjuntas road, near Ponce, Heller 6198. These specimens are doubtfully referred here.

3. ERAGROSTIS ELLIOTII S. Wats. Proc. Am. Acad. 25: 140. 1890.

*Poa nitida* Ell. Bot. S. C. & Ga. 1: 162. 1817. Not Lam. 1791.

*Eragrostis nitida* Chapm. Fl. S. U. S. 564. 1860.

Moist sandy soil, Santurce, Heller 584.

4. ERAGROSTIS HYPNOIDES (Lam.) B.S.P. Prel. Cat. N. Y. 69. 1888.

*Poa hypnoides* Lam. Ill. 185. 1791.

Roadsides, Rio Piedras, Heller, 649; Bayamon, Sintenis 1225.

36. *UNIOLA* L. Sp. Pl. 71. 1753

1. *UNIOLA RACEMIFLORA* Trin. Bull. Sc. Acad. St. Petersburg. 1: 68.  
1836.

Near Salinas de Cabo Rojo, Sintenis 839.

37. *ARTHROSTYLIDIUM* Rupr. Mem. Acad. St. Petersburg.  
VI. 5: 117. 1839

Leaf-blades very narrowly linear or hair-like.

1. *A. capillifolium*.

Leaf-blades lanceolate.

2. *A. multispicatum*.

1. *ARTHROSTYLIDIUM CAPILLIFOLIUM* Griseb. Mem. Am. Acad. II.  
8: 531. 1863.

Near Sabanagrande, climbing on tall trees, Sintenis 3891.

2. *ARTHROSTYLIDIUM MULTISPICATUM* Pilger in Urban, Symb. Ant.  
2: 341. 1901.

In woods near Maricao and Adjuntas, Sintenis 209 and 4016  
(according to Pilger).

A number of other specimens of the Bambuseae are in collections, but they are without inflorescence and so undeterminable.

NEW YORK BOTANICAL GARDEN.